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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/808,843	03/15/2001	Peter Crane	169.12-0487	5267

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EXAMINER

CHEN, TIANJIE

ART UNIT PAPER NUMBER

2652

DATE MAILED: 02/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/808,843

Applicant(s)

CRANE ET AL.

Examiner

Tianjie Chen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-6 is/are allowed.
- 6) ☒ Claim(s) 7-10, 12-17 and 20 is/are rejected.
- 7) ☒ Claim(s) 11, 18 and 19 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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Non-Final Rejection

Claim Objections

1. Claim 11 is objected to because of the following informalities:

In claim 11, line 2; "the rotor" should be changed to --a magnet bonding pad--.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 7-10, 12-16, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Adams et al (US 6,466,412) in view of Takeuchi et al (US 6,456,934).

With regard to claim 7, Adams et al shows a disc drive having an inherent recording disc rotatable about an axis, a slider 20 (Fig. 2; column 3, line 66 to column 4, line 1) supporting a transducing head for transducing data with the disc, and a actuation assembly supporting the slider to position the transducing head adjacent a selected radial track of the disc, the actuation assembly comprising: a movable actuator arm 32; a suspension assembly 12 supported by the actuator arm (Fig. 2; column 3, line 66 to column 4, line 13), the suspension assembly including a flexure 16; a slider holding pad 50 supporting the slider;

Adams et al does not show a dual-stage actuation assembly supporting the slider to finely position the transducing head, and a microactuator.

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Takeuchi et al shows a microactuator in Fig 21(d) including: a rotor 72 attached to the slider (Column 18, line 57 and 14, lines 10-18); a stator 70; and a beam structure (73 A-D and 74 A-B) operatively connecting the rotor 72 and to the stator 70 (Column lines 9-25) so as to permit movement of the rotor with respect to the stator, the beam structure including a first beam pair element 73B and 73C aligned with a width of the rotor and a second beam pair element 73A+74A and 73D+74B aligned with a length and the width of the rotor.

It would have been obvious at the time the invention was made to one of ordinary skill in the art to add the microactuator taught by Takeuchi et al into Adams et al's device in following way: the slider is attached on the rotor, and then a stator would be attached to the flexure thus forming a dual-stage actuation assembly. The rationale is as follows: Takeuchi et al teaches that the microactuator can be used for positioning the slider on the sub-micron order (Column 1, lines 31-33). One of ordinary skill in the Art would have been motivated by Takeuchi et al's teaching to add the micro-actuator, thus obtaining a sub-micron precision.

With regard to claim 8, Takeuchi et al further shows that the first beam pair element comprises two first beam elements 73B and 73C.

With regard to claim 9, Takeuchi et al further shows that the two first beam elements define a rotation center (Fig. 21(d); column 18, lines 53-58), the rotation center defining a center of in-plane rotation of the rotor.

With regard to claim 10, Takeuchi et al further shows in Fig 21(d) that the rotor 72 is balanced about the rotation center since the structure is symmetrical.

With regard to claim 12, Takeuchi et al further shows that the second beam pair element includes two second beam elements 73A+74A and 73D+74B in a dog-leg

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configuration, comprising: a left lateral beam wherein the length of 74A is aligned with the length of the rotor and the transverse length of 73A is aligned with the width of the rotor; and a right lateral beam wherein the length of 74B is aligned with the length of the rotor and a transverse length 73D is aligned with the width of the rotor.

With regard to claim 13, Takeuchi et al further shows that the second beam pair element 74A is connected to the stator 70.

With regard to claim 14, Takeuchi et al further shows that a proximal connector (the portion of 74A near the stator 70 connecting the proximal end of the rotor 70 and the second beam pair element 74A+73A).

With regard to claim 15 Takeuchi et al further shows that the proximal connector is attached to the left lateral beam and the right lateral beam.

With regard to claim 16, Takeuchi et al further shows that the beam structure has a height of approximately 200 microns (Column 19, lines 61-64).

With regard to claim 20, Adams et al shows a disc drive having an inherent recording disc rotatable about an axis, a slider 20 (Fig. 2; column 3, line 66 to column 4, line 1) supporting a transducing head for transducing data with the disc, and a actuation assembly supporting the slider to position the transducing head adjacent a selected radial track of the disc, the actuation assembly comprising: a movable actuator arm 32; a suspension assembly 12 supported by the actuator arm (Fig. 2; column 3, line 66 to column 4, line 13), the suspension assembly including a flexure 16.

Adams et al does not show a dual-stage actuation assembly supporting the slider to finely position the transducing head; and a microactuator including: a rotor attached to the slider; a stator attached to the flexure; and means for operatively

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connecting the rotor to the stator so as to permit movement of the rotor with respect to the stator, wherein the means permits microactuation of the microactuator while resisting motion of the stator out of a horizontal plane of the microactuator and resisting motion of the slider longitudinally.

Takeuchi et al shows a microactuator in Fig 21(d) including: a rotor 72 attached to the slider (Column 18, line 57 and 14, lines 10-18); a stator 70; means including beam structure 73 A-D, 74 A-B, 73A+74A, and 73D+74B for operatively connecting the rotor to the stator so as to permit movement of the rotor with respect to the stator, wherein the means having a thickness of 300 microns (Column 19, lines 61-64) permits microactuation of the microactuator, which resists motion of the stator out of a horizontal plane of the microactuator and resisting motion of the slider longitudinally since which has aspect ratio as low as 0.4 (Column 19, line 65-67).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to add the microactuator taught by Takeuchi et al into Adams et al's device in such a way: the slider is attached on the rotor, and then a stator would be attached to the flexure thus forming a dual-stage actuation assembly. The rationale is as follows: Takeuchi et al teaches that the microactuator can be used for positioning the slider on the sub-micron order (Column 1, lines 31-33). One of ordinary skill in the Art would have been motivated by Takeuchi et al's teaching to add the micro-actuator, thus obtaining a sub-micron precision.

3. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Adams et al and Takeuchi et al as applied to claim 16 above, and further in view of Applicant Admitted Prior Art (AAPA).

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With regard to claim 17, Takeuchi et al does not show that the rotor stresses the beam structure to less than approximately 8.8% of its breaking strength.

However, AAPA shows that the rotor stresses the beam structure to about 8.8% of its breaking strength (p. 7 line 22 to p. 8, line 3 in Specification).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to expect that the rotor stresses the beam structure to about less than approximately 8.8% of its breaking strength, which includes less than approximately 8.8% of its breaking strength because 8.9% is approximately 8.8% and 8.8% is less than 8.9%.

Allowable Subject Matter

4. Claims 1-6 are allowed.

Claims 11, 18, and 19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

5. The following is a statement of reasons for the indication of allowable subject matter:

- With regard to claim 1, as the closest reference, Takeuchi et al (US 6,465,934) shows a microactuator having a stator and a rotor which holds the slider and is movable with respect to the stator; but fails to show means for limiting deflection of the stator out of a plane defined by the microactuator frame; wherein means is referred to a structure which is limited to the microactuator having exact structure shown in Figs. 3-5 and described in specification, pp. 4-6.

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Applicant assumes that the above mentioned means would prevent the stator from significantly shifting vertically out of the horizontal plane of microactuator and minimize the amount of vertical deflection (p. 6, lines 20-22 in Specification).

- With regard to claim 11, as the closest reference, a combination of Adams et al (US 6,466,412) and Takeuchi et al (US 6,465,934) shows a microactuator, but fails to show a distal connector connecting the distal end of a magnet bonding pad and a slider bonding pad, wherein the distal connector is located at the rotation center.

With regard to claim 18, as the closest reference, a combination of Adams et al (US 6,466,412) and Takeuchi et al (US 6,465,934) shows a microactuator, but fails to show at least one deflection limiter for limiting deflection in the direction of the length of the rotor.

Applicant assumes that the above mentioned structures would stop further movement of the slider as the slider is pulled away from the stator approximately 50 microns (pp 8-9 in Specification).

Conclusion

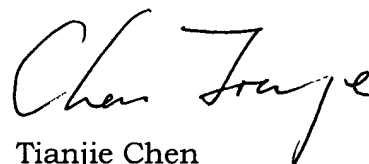
6. The prior art made of record in PTO 892 form and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tianjie Chen whose telephone number is (703) 305-7499. The examiner can normally be reached on 8:00-4:30, Mon-Fri.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa Nguyen can be reached on (703) 305-9687. The fax phone numbers for the organization where this application or proceeding is assigned are (703)746-6037 for regular communications and (703) 872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 306-0377.

A handwritten signature in cursive script, appearing to read "Chen Tianjie".

Tianjie Chen
Examiner
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February 10, 2003